

PROJECT MANAGEMENT PLAN EXAMPLES

Prepare Project Support Plans and Documentation - Environmental Plan Examples

Example 51

8.1 ENVIRONMENTAL STRATEGY

A significant part of the strategy for maintaining compliance with environmental regulatory requirements during the PFP Stabilization and Deactivation Project is to apply the process described in the Tri-Party Agreement, Section 8.0, "Facility Decommissioning Process." The Section 8.0 process will allow the DOE to develop agreements with the State and Federal regulatory agencies facilitating timely stabilization of the PFP inventory of plutonium-bearing materials, deactivation of the PFP Complex, and perhaps elimination of all above ground hazards at the PFP Complex through dismantlement of the buildings and structures. The Section 8.0 process also provides the means for DOE to ensure the public and stakeholders get an opportunity to express their interests in how this work is accomplished.

Another part of this strategy is the application of lessons learned from other deactivation projects. Lessons learned from Hanford Site transition projects (e.g., PUREX and B Plant) and commercial deactivation projects will be reviewed for environmental and regulatory compliance process improvements.

The overall goal of this strategy is to comply with all applicable environmental laws and regulations during PFP stabilization, deactivation, and eventual dismantlement. Significant environmental drivers include the Tri-Party Agreement; RCRA; the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA); NEPA; the National Historic Preservation Act (NHPA); the Clean Air Act (CAA), and the Clean Water Act (CWA).

Although a formal decision has not been made to dismantle the PFP Complex, the following discussions assume dismantlement as part of the planning case.

8.1.1 Resource Conservation and Recovery Act

The PFP Stabilization and Deactivation Project includes a number of activities falling under the requirements of RCRA. Activities at the PFP bounded by the RCRA requirements include the management and permitting of treatment and storage units, and waste generator activities. These are discussed in detail in the following sections.

8.1.1.1 RCRA Unit Management . The PFP currently operates one interim status dangerous waste management unit under the requirements of the Washington State Administrative Code and the Tri-Party Agreement. This unit, the 241-Z Treatment and Storage Tank System (TS-2-3), is operated in compliance with applicable interim status requirements of Title 40, Section 265, of the Code of Federal Regulations (CFR) and Tri-Party Agreement Milestone M-32. Operation of the 241-Z Treatment and Storage Tank System is anticipated throughout completion of material stabilization activities, and through much of the PFP Complex transition activities.

All Tri-Party Agreement M-32 milestones for the 241-Z tank system have been completed to assess system integrity, and a Closure Plan for the unit was submitted in December 1996 in accordance with Milestone M-20-48A. The operation of the 241-Z tank system is anticipated to be extended at least 10 years beyond that originally planned. Therefore, further actions may be required to verify system integrity during the PFP Stabilization and Deactivation Project. Additionally, the closure plan has not been approved. Discussions with Ecology are required to determine the appropriate actions for continued operation of this tank system, including final status permitting and additional integrity assessment.

8.1.1.2 RCRA Permitting . The PFP currently has a Part A, Form 3, Dangerous Waste Permit Application filed for the 241-Z Treatment and Storage Tank System. The plant has also recently submitted a Part A, Form 3, permit application to the State of Washington as a result of the planned operation of the 234-5Z Cementation Process (TS-2-8). The cementation process Part A includes dangerous waste codes known to be applicable to residues containing less than 30 weight percent plutonium. However, additional residue characterization work may result in a need to revise this Part A permit application to identify additional waste codes. The 234-5Z Cementation Process is permitted as a miscellaneous treatment unit. As such, the interim status standards for management of the unit must be determined based on discussions with Ecology. These discussions have been held, and a written response from Ecology regarding these standards is pending.

The current revision of the PFP Part A permit application for the cementation process assumes no permitted storage is needed for plutonium-bearing materials that will be treated through cementation. This position is based on a determination that those materials do not become waste until a decision is made by DOE that the material, based on non-destructive analysis and visual inspection, is appropriate for cementation, and the materials are introduced into the cementation process. It is also based on a determination that the treated waste is considered a newly generated waste following the treatment process based on applicable waste codes. Following this logic, the newly generated waste will be managed in a satellite accumulation area as it exits the cementation process, and subsequently in a less than 90-day accumulation area prior to being shipped to a permitted TSD unit. This position, however, may not apply to some waste forms currently planned for cementation, as the waste codes assigned to the waste following treatment are anticipated to be the same as those assigned to the waste prior to treatment. Therefore, if a

final determination to treat the materials through the cementation process is made following detailed characterization of the materials, a revision of the PFP Part A permit application for 234-5Z may be required to include waste storage.

As a part of the disposition plan for plutonium-bearing ash, ash will be packaged directly into "pipe-and-go" containers at PFP and placed in interim storage until disposal at WIPP. It is possible that this interim storage activity will be carried out within the confines of PFP. If so, the storage location will need to be permitted under RCRA.

Permitting issues for the various stabilization methods will be evaluated and resolved by the respective sub-project plans. These decisions should include: the completeness of waste codes identified in the 234-5Z permit, the need for storage capacity in the 234-5Z permit, and the applicability of RCRA to other stabilization methods.

In regards to the remaining plutonium-bearing materials currently stored at PFP, a pending issue still remains with regard to the applicability of RCRA to SNM. This issue was identified as a "Silver List" (RL 1995) issue (six issues identified), registered with Ecology, and is the only "Silver List" issue that remains open. If it is determined through discussions with Ecology that RCRA does apply to SNM and at what point it applies, additional permitting may be required.

8.1.1.3 RCRA Less Than 90-Day Generator Activities . PFP currently operates a less than 90-day accumulation area and several satellite accumulation areas as part of routine facility operations. Additionally, as part of the cementation process, PFP plans to satellite the treated cemented waste until an appropriate quantity, based on radionuclide concentration, is accumulated to be packaged in a drum (not to exceed the regulated limit of 55 gallons of waste). This waste will then be placed in the less than 90-day accumulation area and managed accordingly.

8.1.2 Comprehensive Environmental Response, Compensation and Liability Act

Several waste management units listed in Table 2-1 are identified as CERCLA Past Practice Units in Appendix C of the Tri-Party Agreement. The units, including several cribs, french drains, and septic tanks, are currently identified as being part of Operable Unit 200-ZP-2. Ongoing Tri-Party Agreement negotiations may administratively move some or all of these units to other Operable Unit numbers. The majority of these units will be stabilized and turned over to EM-40 at the completion of the PFP Stabilization and Deactivation Project for final remediation in accordance with the *Hanford Strategic Plan* (RL 1996a) for the Central Plateau.

Tank 241-Z-361 is identified in the Tri-Party Agreement, Appendix C, as a unit to be remediated under the authority of CERCLA. As such, the EPA will serve as the lead regulatory agency for remediation of this tank under the CERCLA process. In 1997, the parties to the Tri-Party Agreement began a process to redefine the 200 Area Operable Units into waste site groupings (RL 1997b). A waste group contains waste sites that share similarities in geological conditions, function, and types of waste received.

Tank 241-Z-361 is identified within the CERCLA Plutonium/Organic-rich Process Condensate/Process Waste Group (RL 1997b). This waste group has been prioritized for remediation beginning in the year 2004. Results of planned Tank 241-Z-361 sampling and analysis will determine whether expedited response actions are required before 2004 because of the hazards associated with the tank contents. Should data indicate that remediation of this tank should occur earlier than is planned for the other sites in the waste group, it is likely that removal alternatives will be analyzed in a separate Engineering Evaluation/Cost Analysis. Removal actions would proceed after the EPA signs an Action Memorandum describing the selected removal alternative for Tank 241-Z-361. If the data indicate that there is no immediate threat to human health and the environment from this tank, remedial actions for the tank will be defined in a feasibility study for the entire waste group.

End points negotiated with the EPA for the 241-Z-361 Tank will focus on removal of the legacy hazardous materials within the tank and stabilization of the tank structure. Reclamation of the tank structure and soil remediation activities, if necessary, are not included in the scope of the PFP Stabilization and Deactivation Project. Hazardous materials removed from 241-Z-361 will be managed appropriately under the RCRA hazardous waste management requirements.

8.1.3 National and State Environmental Policy Acts (NEPA and SEPA)

Significant decisions have been made regarding the PFP Stabilization and Deactivation Project activities through the NEPA process as required for significant government actions per 10 CFR 1021, Subpart D, Appendix D. These include publication of the *Plutonium Finishing Plant Stabilization Final Environmental Impact Statement* (RL 1996b), and the ROD (DOE 1997) and associated amendment (DOE 1998a) for the *Storage and Disposition of Weapons-Usable Fissile Material Final Programmatic Environmental Impact Statement* (DOE 1996b).

The *Record of Decision for Plutonium Finishing Plant Stabilization Final Environmental Impact Statement* (RL 1996d) included decisions by DOE to implement a group of stabilization alternatives including thermal stabilization, pyrolysis, calcination, and a cementation process for immobilizing materials less than 50% by weight plutonium. This ROD also provided for removal of readily retrievable plutonium-bearing materials held-up in PFP systems and structures by intrusive and destructive means, and the subsequent stabilization or immobilization of the material through methods identified in the ROD. A Supplemental Analysis to the PFP Stabilization Final EIS is being prepared to evaluate the environmental impacts of increasing batch sizes for metals and oxides. Additional NEPA documentation will be required to evaluate other changes in the revised materials stabilization and disposition baseline.

The *Record of Decision for the Storage and Disposition of Weapons-Usable Fissile Material Final Programmatic Environmental Impact Statement* (DOE 1997) and a subsequent *Draft Surplus Plutonium Disposition EIS* (DOE 1998b) address the storage and ultimate disposition of surplus plutonium and weapons-usable highly enriched uranium currently stored at many DOE facilities. Included in these documents are evaluations of the immobilization of surplus weapons material into glass or ceramic forms, and the use of surplus material as mixed oxide fuel in existing domestic commercial reactors. A supplement to the *Draft Surplus Plutonium Disposition EIS* is currently in preparation and will examine the environmental impacts of using mixed oxide fuel in six

specific commercial nuclear reactors.

The majority of the deactivation activities for the PFP Stabilization and Deactivation Project are expected to fall within the scope of existing sitewide categorical exclusions (CXs) (e.g., CX B1.23, "Demolition of Surplus/Excess Buildings and Structures," and CX B1.27/28, "Categorical Exclusion for Building Stabilization and Deactivation Activities") or CXs developed for PFP specifically. However, NEPA review of the deactivation work scope for PFP will have to be performed to determine the extent of coverage by these existing NEPA CXs. The need for additional NEPA documentation will be evaluated in the development of respective sub-project plans.

According to the RL NEPA Compliance Officer, demolition of the PFP Complex may fall under a CERCLA action with NEPA values incorporated. In this case, it is not likely to qualify as a project-specific CX because it could be considered a connected action to the decommissioning of nuclear fuel processing facilities, which is identified in 10 CFR 1021, Subpart D, Appendix D. (Appendix D actions normally require preparation of an EIS.) However, before the level of NEPA or CERCLA documentation can be determined for dispositioning the PFP Complex, an evaluation needs to be completed and a decision made regarding the final state of the buildings and structures (i.e., deactivate to long-term S&M versus dismantlement to clean slab-on-grade, etc.). This key decision must be made prior to beginning deactivation of any of the significant facilities the PFP Complex. Therefore, the evaluation for determining the end point target for buildings and structures should be initiated as soon as funding allows.

Additionally, NEPA coverage must also be considered for the characterization and remediation of hazardous materials in Tank 241-Z-361, and stabilization of several of the plutonium-bearing materials (i.e., fuel pins [non-spent fuel], special isotopes, and plutonium compounds containing zirconium, thorium, and beryllium) not previously covered in the *Plutonium Finishing Plant Stabilization Final Environmental Impact Statement* (RL 1996b). In June 1998, a determination was made that the *Storage and Disposition of Weapons-Usable Fissile Material Final Programmatic Environmental Impact Statement* (DOE 1996b) covers the impacts of transporting the highly enriched uranium from Hanford to Oak Ridge. In the case of Tank 241-Z-361, incorporating NEPA values into the CERCLA decision-making documentation will provide NEPA coverage. NEPA review is required to determine the level of NEPA documentation that will be required to stabilize or disposition the plutonium-bearing materials not covered by the PFP Stabilization Final EIS.

Required SEPA Environmental Requirements Checklists have been submitted to Ecology for the two PFP RCRA-regulated dangerous waste management units. Additional SEPA documentation will be provided, as necessary, in accordance with Chapter 197-11 of the State of Washington Administrative Code (WAC).

8.1.4 National Historic Preservation Act

The provisions of the NHPA, found in 36 CFR 63, "Determination of Eligibility for Inclusion in National Register," require Federal agencies to survey all lands and structures under their control and to identify and evaluate all properties for their eligibility for listing in the National Register of Historic Places. In 1996, the Washington State Historic Preservation Office (SHPO), RL, and the Advisory Council on Historic Preservation approved the "*Programmatic Agreement (PA)...For the Maintenance, Deactivation, Alteration and Demolition of the Built Environment, on the Hanford Site, Washington*" (RL 1996c)." This PA states that all undertakings at the Hanford Site affecting historic buildings and structures included in or eligible for the National Register will be administered to satisfy the requirements under the NHPA. The PA addresses the built environment (i.e., buildings and structures) constructed during the Manhattan Project and Cold War Era periods of Hanford's operational history (i.e., 1943 through 1990).

The Building Mitigation Project was established to perform the activities required for compliance with the NHPA as agreed upon in the PA. Using the National Register criteria, as well as historic contexts and themes developed for use on the Hanford Site, the Project identified a Hanford Site Manhattan Project and Cold War Era Historic District, and 190 buildings that are representative of all the building types on the Hanford Site. As a minimum, each representative building within the Hanford Site Historic District has been documented on a Historic Property Inventory Form (HPIF).

Ten buildings at the PFP Complex have been identified as being representative building types on the Hanford Site; these buildings are 234-5Z, 234-5ZA, 236-Z, 242-Z, 2701-ZA, 2704-Z, 2736-Z, 2736-ZA, 2736-ZB, and 291-Z. A HPIF has been completed for each of these buildings. Currently, the sitewide treatment plan (RL 1997a) indicates that demolition is the expected future condition of the representative building types at the PFP.

However, public meetings were held in 1997 and 1998 to identify buildings that should be recommended for preservation to represent the Hanford Site Historic District and to be used for public education and interpretation. Four buildings at the PFP (i.e., 234-5Z, 236-Z, 291-Z, and 2736-Z) were recommended for preservation through this process. A final treatment report is being developed (Chapter 4, Hanford Site Treatment Report, being developed), which may recommend that these buildings, along with other buildings associated with the fuel manufacturing, reactor operations, and chemical separations processes, be given a high priority for reuse, and where possible, retention for educational use or historic interpretation.

A curation strategy for objects representing the Hanford Site Manhattan Project and Cold War Era Historic District has been developed, and implementation of the curation strategy has been initiated. An artifact identification team toured PFP buildings to identify artifacts that are representative of the plutonium finishing process. Items at the PFP have been tagged. Artifacts that are not contaminated or that can be decontaminated economically will need to be removed and placed in suitable storage for historic artifacts.

Facility stabilization, deactivation, and dismantlement activities will substantially alter or demolish existing equipment and structures at PFP that have been found to be eligible for inclusion in the National Register of Historic Places. The Building Mitigation Project should be contacted before building clean out or demolition is initiated to ensure all actions required to comply with the PA are complete.

8.1.5 Clean Air Act

Section V of the CAA, adopted in the 1990 amendments to the CAA, establishes a federal permitting program, which will be administered by the states. Any "major source" of criteria pollutants or hazardous air pollutants will be required to obtain a permit to operate the source. New activities, construction, and/or modifications at the PFP Complex that have the potential for increasing radioactive air emissions are required to be evaluated to determine if an NOC needs to be developed.

Six registered stacks service the PFP Complex and are described in the *Facility Effluent Monitoring Plan for the Plutonium Finishing Plant* (WHC 1993). Only one of these stacks, 291-Z-1, is considered a major stack under the requirements of 40 CFR 61 and WAC 246-247. Individual stabilization activities discussed in the *Record of Decision for Plutonium Finishing Plant Stabilization Environmental Impact Statement* (RL 1996d) have been evaluated with regard to emissions permitting requirements, and NOCs have been submitted and approved for ductwork remediation, thermal treatment in muffle furnaces, and use of the vertical denitration calciner. Approval for the cementation process was granted in a routine technical assistance meeting by the WDOH. Because these NOCs have been inactive for some time, reviews of the NOCs will be needed prior to start/restart of the permitted activities. These reviews could lead to revisions of the NOCs.

It is likely that NOCs will also be required for planned pyrolysis activities and for stabilization of solutions using the magnesium hydroxide precipitation process. Additionally, modifications associated with the installation and operation of the final material repackaging system may involve construction of a new stack and will require the development of an NOC.

Planning is underway to open and passively ventilate the 241-Z-361 Tank. Due to the source term contained within the tank, this passive vent will need to be registered as a major stack and included in the Hanford Site Air Operating Permit. However, no NOC will be required for the sampling or venting of the tank because the activities will be conducted under the requirements of CERCLA. Emissions control and monitoring requirements will be applied as Applicable or Relevant and Appropriate Requirements.

After the technical bases for deactivation and dismantlement activities are prepared, and specific activities are identified, the activities will be evaluated for their potential to increase emissions to the atmosphere. Those activities will then be compared against the Hanford Site Air Operating Permit and the NOCs already available to determine if additional documentation is required. Any activity requiring an NOC will also require modification of the Hanford Site Air Operating Permit.

Upon completion of the PFP Stabilization and Deactivation Project, assuming the final plant condition is dismantlement, all facility stacks will be demolished, and notices of closure will be submitted to the appropriate regulatory agencies.

8.1.6 Clean Water Act/Safe Drinking Water Act

The Clean Water Act of 1977 requires any source that discharges a "pollutant" into a surface water body to obtain and operate in compliance with a National Pollution Discharge Elimination System permit. Currently, there are no effluent streams discharged from the PFP Facility into a surface water body.

Liquid effluent discharges from the PFP Complex may be broken into three distinct waste streams: process wastes, low level liquid waste, and the sanitary/septic stream. Process wastes are managed under the dangerous waste management regulations of WAC 173-303 and 40 CFR 265 in the 241-Z Treatment and Storage Tank System.

Low level liquid wastes are piped to the 243-Z Low Level Liquid Waste Treatment Building where they are treated. After discharge from the 243-Z Building, the treated waste stream is joined by a non-contaminated waste stream (e.g., storm water run-off from the roof of the 234-5Z Building) and discharged via the 225-WC Building to the Hanford Site Treated Effluent Disposal Facility. This waste stream is managed under Tri-Party Agreement Milestone M-17.

Two separate sanitary septic systems service the PFP Complex. A septic tank southwest of the 234-5Z Building services the 2736-Z Vault Complex. The tile field associated with that septic tank has failed; as a result, the tank must be pumped regularly. The septic waste stream from the remainder of the PFP Complex flows through a septic tank located just east of the 236-Z Building and is discharged east of PFP to a tile field outside the exclusion fence.

Project L-281, euphemistically known as the 200 West Area Septic mega-system, is expected to replace the PFP septic tanks and tile fields in FY 1999. A new septic line is being routed to the southwest side of the PFP compound, around the 234-5Z Building, and out the northeast side of the compound. From there, the waste will be routed for disposal at a large tile field near the 284-W Power Plant. Project L-281 is a DynCorpTri-Cities Services, Inc. modification to the existing 2607-W1 septic system and has a design capacity of less than 14,500 gallons. The WDOH is approving installation of the new system pursuant to WAC 246-272. After successful tie-in to Project L-281, PFP will proceed with closure of its two septic tanks.

During PFP deactivation/dismantlement, all PFP Complex liquid waste streams will be permanently eliminated. Any remaining lines will be blanked, and drains will be plugged.

8.1.7 Tri-Party Agreement Applicability

The PFP received a shutdown order from DOE-HQ in October 1996 (Lytle 1996). The PFP Complex is identified as a "key facility," subject to the requirements of Section 8.0 of the Tri-Party Agreement.

The PFP Complex currently operates one dangerous waste management unit, as discussed in Section 8.1.2.1 of this document, and plans to operate a second. These units are subject to the requirements of Section 6.0 of the Tri-Party Agreement and Major Milestones M-20 and M-32. The PFP Complex also includes past-practice units, including the 241-Z-361 Tank, discussed in Section 8.1.3 of this document. Past-practice units are subject to the requirements of Section 7.0 of the Tri-Party Agreement. The PFP Stabilization and Deactivation Project as a whole is subject to Section 8.0 of the Tri-Party Agreement and Major Milestone M-83. Additional portions of the Tri-Party Agreement that are applicable to the PFP include Appendix C (Prioritized

Listing of Operable Units) and Major Milestone M-17 (pertaining to waste water discharges to the environment).

8.1.8 Tri-Party Agreement Transition Negotiations

The following sections describe the status of Tri-Party Agreement negotiations for PFP transition, the prospective importance of the IPMP to future negotiations, and a strategy for future negotiations. The strategy is the cornerstone to successful negotiation of key project milestones between RL, the State of Washington, and the EPA.

8.1.8.1 Tri-Party Agreement Negotiations Status . The following provides a summary timeline to status the PFP Tri-Party Agreement transition negotiations:

February 1996	M-83 change package signed. "Complete stabilization of process areas, and other PFP clean out actions resulting from the EIS ROD, within PFP."
July 1996	<i>Record of Decision for Plutonium Finishing Plant Stabilization Final Environmental Impact Statement</i> (RL 1996d) published in the Federal Register.
October 1996	RL receives formal shutdown notice for PFP operations from EM-65.
April 1997	Interim milestone for completion of PFP transition negotiations by March 31, 1998, established.
August 1997	Formal transition negotiations for PFP initiated.
December 1997	Ecology and the EPA suspend PFP transition negotiations.
January 1998	RL responds to Ecology negotiation suspension issues and requests Ecology and the EPA to resume negotiations.

In the December 1997 letter in which Ecology and the EPA suspended PFP transition negotiations, the regulatory agencies identified three key issues they felt must be adequately resolved in order to resume negotiations. These issues were:

- Uncertainty regarding scope (i.e., what portions of PFP are, or in fact whether or not PFP is truly, going through transition at this time),
- Uncertainty regarding schedule (i.e., necessary and planned PFP transition work), and
- DOE failure to make timely and definitive waste/material decisions and to manage its wastes and materials accordingly.

Although RL responded in January 1998 and April 1999, transition negotiations have not yet been resumed.

This IPMP, the associated sub-project plans, and detailed cost estimates and schedules, provide the necessary ground work to resolve Ecology's and EPA's concerns identified in the December 1997 letter, and should provide the frame work to reestablish negotiations between Ecology, EPA, and RL on key PFP stabilization and transition activities.

8.1.8.2 Tri-Party Agreement Negotiations Strategy . The PFP Stabilization and Deactivation Project is a complex mission that is expected to have a duration of 10 to 20 years. Given such a long project duration, it would be unreasonable to expect that transition milestones could be settled on now for the complete project with any certainty of success. Therefore, the negotiation strategy for establishing the milestones for the PFP Stabilization and Deactivation Project is to develop the milestones in a phased approach commensurate with the availability of a sound planning basis that supports the milestones.

With this in mind, the following phases of milestone development are proposed:

- Phase I – negotiation of milestones to resolve outstanding compliance issues at the PFP,

- Phase II – negotiation of milestones for completion of material stabilization activities,
- Phase III – negotiation of milestones for disposition of stabilized plutonium-bearing materials, and
- Phase IV – negotiation of milestones for PFP Complex deactivation and dismantlement.

Phase I negotiations could be initiated at any time. Initiation of Phase II negotiations in FY 2000 would allow PFP to fully develop the respective stabilization sub-project plans and associated detailed planning required for negotiating sound, defensible milestones. Initiation of Phase III negotiations for disposition of stabilized materials would likely take place in 2004 through 2007 commensurate with the completion of stabilization activities, and the initiation of disposition actions. Finally, Phase IV would develop the basis of PFP deactivation and dismantlement actions. Milestone discussions would be appropriate in fiscal years 2005 through 2007 as buildings and systems required for stabilization activities would become available for deactivation as stabilization and packaging is completed.

Example 52

10.0 REGULATORY AND ENVIRONMENTAL STATUS AND STRATEGY

10.1 RCRA STATUS AND STRATEGY

Current RCRA Status

A. Stored, Containerized HEU Material

The 9206 Complex stores containerized HEU materials contaminated with RCRA constituents (mixed waste) located in four areas permitted under the Tennessee Department of Environment and Conservation (TDEC) Permit (TNHW-084). They are listed below and shown in Fig. 10.1, 10.2, 10.3:

Room 24	(Drawing #: S2E920600A166)
Room 30	(Drawing #: S2E920600A165)
Room 100W	(Drawing #: S2E920600A164)
Building 9720-17	(Drawing #: S2E972017A002)

The 9206 facility is permitted to store RCRA material assigned the following codes: F001, F002, F005, D002, D004-D011, D018, D019, D021-D030, D032-D043. The permitted areas are used to store RCRA and non-RCRA in-process materials scheduled for HEU recovery. Weekly inspections of the RCRA permitted areas are performed and documented according to the RCRA permit requirements.

B. In-Process HEU Material

Document Y/TS-896, *Enriched Uranium Process Resource Conservation and Recovery Act (RCRA) Regulatory Compliance Plan*, dated August 1992, describes the HEU recovery process and those steps regulated under RCRA. A letter from the State of Tennessee, dated 12/04/94 approves this plan. In this letter, the State declares that "(2) Characteristically hazardous by-products that are reclaimed are not solid waste as outlined in the regulations. (3) It was mutually agreed by both MMES and TDEC that the enriched uranium operations are, in fact, recovery activities, as defined by RCRA, and that the Recovery Process is exempt from the permitting section of the regulation except where noted in the regulations. (4) It was agreed by all parties that the acid leaching step is the point in the Recovery Process where uranium is physically separated from the RCRA constituents." See Fig. 10.4, "Enriched Uranium Recovery Facilities, Buildings 9212 and 9206." It is expected that this agreement will be carried forward through the deactivation phase of 9206, as discussed below and per concurrence with the TDEC.

C. Surplus Hazardous Chemicals (non-HEU)

Architectural floor plan of the first floor of Building 9206, showing the typical layout of RCRA storage areas. The plan includes numerous rooms numbered 1 through 34, along with corridors and a dock. Key features include 'RESTORE' areas, 'STORAGE BACK (4 SPACES)', 'SOL. W.', and 'STANDING AREA'. A legend on the right identifies symbols for 'Extraction Phase', 'Solvent Storage', and 'Residue Storage'. Dimensions are provided for various sections, such as 8'3", 18'5", and 12'5".

Fig. 10.1

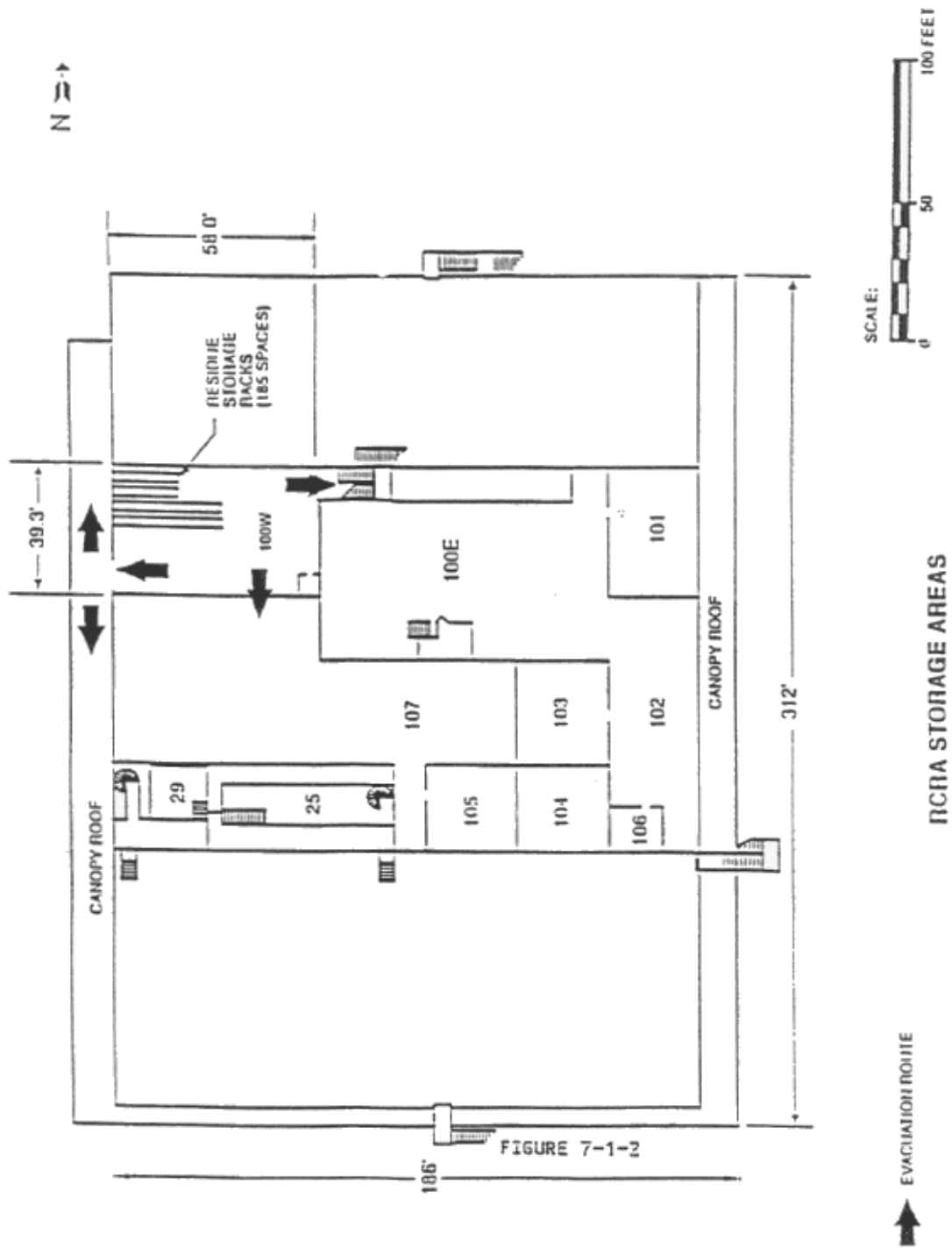


Fig. 10.2

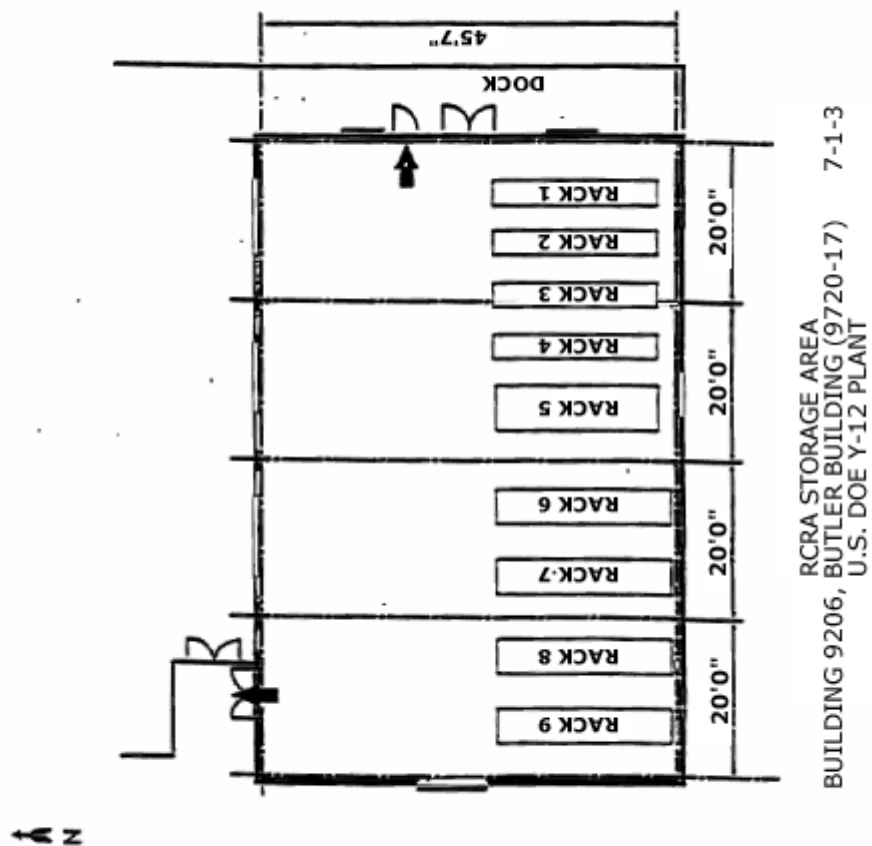


Fig. 10.3

RCRA Strategy for Deactivation Phase

A. Stored, Containerized HEU Material

The RCRA contaminated HEU materials stored in the 9206 facility permitted areas and their candidate disposition paths are described in Section 4.0 and Appendix B of this plan. A major portion of these materials are viable assets for the Y-12 EUO and are scheduled to go to Building 9212 for HEU recovery. The post-processing residues, once below the economic discharge limit, will then be discarded as waste. A waste management plan and schedule will be prepared for this final stage of disposal.

It is anticipated that the individual 9206 RCRA storage areas, i.e. portions of the permitted unit, will be emptied on different schedules as dictated by the 9212 HEU recovery processing availability and schedule. Empty units, or portions of units, will not be inspected, provided a "shutdown inspection" is performed within 30 days after the last remaining hazardous waste is removed from the area, (as outlined in the RCRA operating permit, TNHW-084). The normal inspection frequency will continue until the shutdown inspection is performed. The shutdown inspection log will verify that no hazardous waste is present and include the inspector's name and title, date and time of inspection, types of problems encountered, observations, and date of when and nature of how repairs and remedial actions were made. A startup inspection will be performed prior to reusing the shutdown storage areas.

After all hazardous waste has been removed from the units located within Building 9206, the RCRA closure plan of the units can be activated. It is recommended that the units be closed at one time as a group. An approved closure plan is already located in the operating permit for these units. The permitted areas will be closed according to the identified permit. If conditions have changed where this plan is no longer usable, then a permit modification will need to be submitted to the State of Tennessee requesting these changes. Also, the State is required to be notified writing at least 45 days prior to the date on, which final closure for these container storage areas will commence.

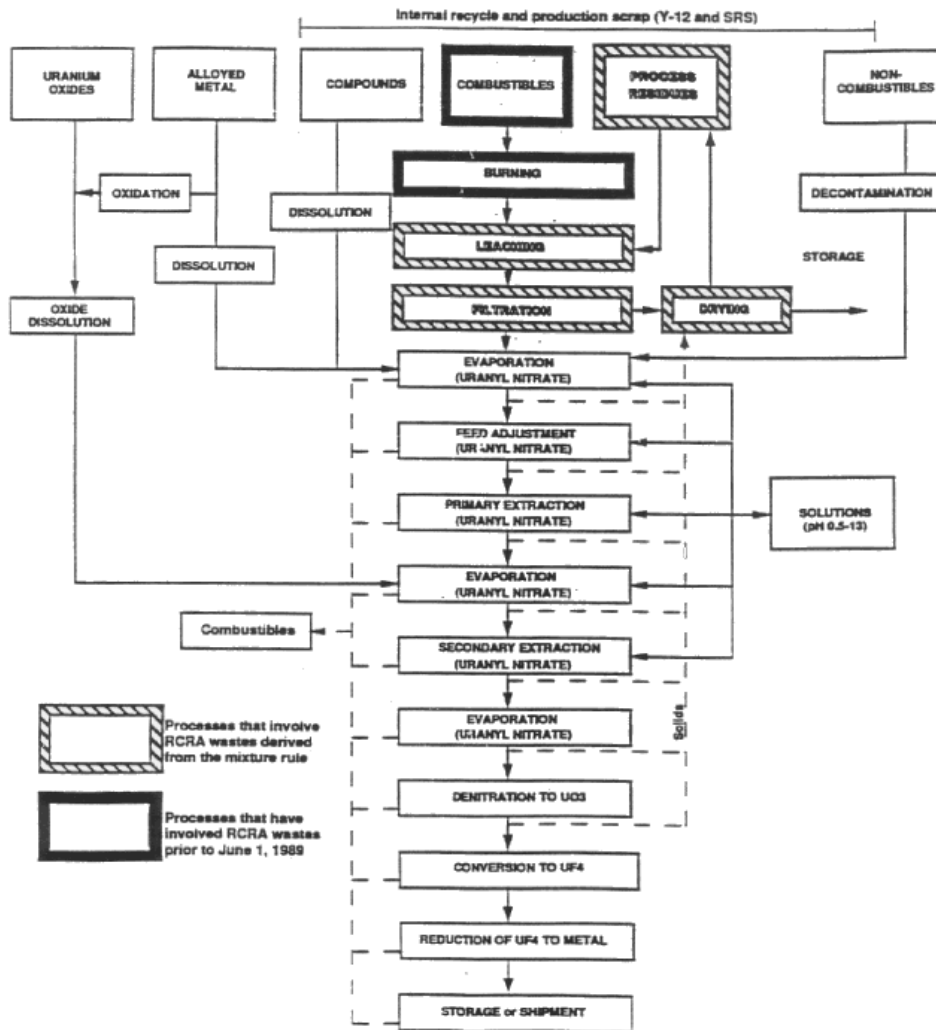
B. In-Process HEU Material

The Y-12 EUO, including 9206 facility, currently have an agreement with the State of Tennessee for the HEU recovery process and those steps regulated under RCRA (Y/TS-896, described above). Per the agreement, the recovery process is exempt from the permitting section of the regulation except where noted and the acid leaching step is the point in the recovery process where uranium is physically separated from the RCRA constituents. (Fig. 10.4) The HEU materials to be removed from the 9206 process systems initially require HEU recovery and will be covered under this agreement until post- processing. Post recovery residues will be evaluated, as appropriate.

Good process knowledge exists and historical data has been compiled to capture the early years of operations. The 9206 staff reviewed the history of Building 9206 operations and the potential chemical usage/generation associated with its processes. Many of the systems that existed in the early years of 9206 operations have been stripped out and replaced with other functions. The chemicals associated with these systems that were specific to that function were removed along with the equipment many years ago.

The 9206 Complex recovery furnace discontinued processing of combustible materials which are RCRA hazardous mixed wastes in June 1989. The recovery furnace (and associated feed sorter/shredder, compactor, etc.) underwent a RCRA closure process. The closure was completed, and TDEC issued a letter of closure certification for the 9206 Complex Recovery Furnace in January 1992. Only non-RCRA uranium-contaminated combustible materials were processed in the 9206 Recovery Furnace from 1992 until the time of the 1994 Y-12 Plant stand down. Existing stored drummed combustibles awaiting HEU reprocessing were segregated into pre and post closure groups. The 9206 recovery furnace will function as a non-RCRA operation if started.

Enriched Uranium Recovery Facilities Buildings 9212 and 9206



For the 9206 process systems still containing residual HEU, RCRA related clean out is being evaluated along with nuclear criticality and NMC&A strategies as part of the end points methodology. In general, systems, equipment, piping and duct work will not be removed during deactivation, except as specifically needed to meet deactivation end state criteria. The systems will remain intact for the post-deactivation S&M phase. The nuclear criticality and NMC&A deactivation criteria will require the removal of nuclear material to the extent that will also address potential RCRA concerns. The predominant removal techniques to be expected for deactivation are the same as those used during routine chemical recovery operations, (i.e. drain; flush with weak nitric acid; sweep; vacuum). A portable dry vacuum, approved by criticality safety, may be utilized in addition to the house dry vacuum system. Wet wiping and flushing with weak nitric acid (performed in place) has been proven over many years of 9206 operations experience to be an effective means of cleaning out systems, pipes and containers, rinsing mops, mopping floors, etc. The RCRA acceptable clean out methods, including "triple flush with nitric acid" are well known at 9206 within established operational practices and was used as a chemical rinse, flushing up to three times to meet NMC&A standards at the end of recovery run(s). It will be utilized, as needed, for 9206 deactivation. Only minimal residual solids/liquids will remain and systems will be declared "RCRA empty" per 40CFR 261.7, except as noted below.

In the event that residual nuclear material cannot be removed by flushing, vacuuming, etc.; and a section of piping, duct work, or equipment must be removed to meet NMC&A or nuclear criticality criteria; the RCRA status, e.g. "debris" rule, will be evaluated after HEU recovery.

As fissile materials are removed from process systems that are designated as RCRA, they will be containerized and stored in one of the 9206 permitted areas until reprocessing and final disposition.

NDA measurements and analytical sampling will be performed at several stages, e.g. before, during and after clean out to support deactivation. Security and NMC&A will require a final walkthrough of the building and that the final conditions of each system be documented before non-MAA status is granted.

C. Surplus Hazardous Chemicals (non-HEU)

The 9206 facility follows waste minimization practices as a part of normal operations and this will continue throughout the deactivation phase. Those chemicals declared as surplus will be listed as available via HMIS and the LMES SWAP Shop. Where possible, potential uses and customers for the materials will be explored and if not, will be finally disposed of as waste. This effort is ongoing and will occur throughout deactivation implementation. Those surplus chemicals with the potential to be declared as "RCRA hazardous waste" have been identified, which will assist the team in prioritizing chemical(s) disposition.

10.6 WASTE MANAGEMENT/LAND DISPOSAL RESTRICTIONS/POLLUTION PREVENTION

The 9206 Complex operations generate sanitary waste, low-level radioactive waste, hazardous waste, contaminated non-combustibles and scrap metal as well as HEU- contaminated combustibles scheduled for HEU recovery prior to wasting disposal. Waste water from the outside Decon Pad Operations is initially pumped to a holding tank, sampled, and then shipped to the WMO for treatment and disposal.

Deactivation Strategy

It is expected that the same waste streams will be generated during deactivation activities. Some cleanup waste solutions, i.e. mop water, will also be generated. As activities are planned and scheduled, a waste management plan will be prepared to address subsequent waste disposal. Appendix A provides additional information for material originally scheduled for HEU recovery, that will generate waste residues after processing at 9212.

Y10-41-010, *Waste Certification of Low-Level Waste, RCRA and/or TSCA Waste, RCRA Mixed and/or TSCA Radioactive Waste, and Liquid Waste to be Treated at the Y- 12 Plant* identifies the process that will be used by the 9206 staff and Y-12 WMO(s) to prepare, transport, certify, treat, and/or ship the above listed wastes. There are no additional land disposal restrictions requirements anticipated at this time.

Waste Minimization/ Pollution Prevention

Removal of excess/unused material now, while the facility is in warm standby status, will reduce future removal costs, as well as facilitate and reduce costs for the removal of the facility from MAA status. Both pollution prevention and waste minimization practices are already an established part of 9206 Complex operations and will be incorporated into deactivation planning and implementation.

Several of the early deactivation preparation and stabilization activities are recognized as waste avoidance and or minimization efforts and will be continued throughout the deactivation phase:

- Identification of usable, surplus equipment during deactivation walk downs and during clean out; for example, new nitric acid tank with drip pan (~ 300 gals.), stainless steel fabricated.
- Identification of surplus hazardous materials; for example, nitric acid< (~300 gals.) to be transferred to 9212 for in-process use; surplus purchased chemicals.
- Depleted uranyl nitrate (8 drums) was sent to the East Tennessee Technology Plant (formerly the Oak Ridge K-25 Site) for in-process use. Additional material's available for customer use, including the organic assay reduction process in Building 9815.
- Contaminated equipment, tools, and materials that could be utilized in other radiological work areas at the Y-12 Plant.

10.7 NEPA and NHPA

The National Environmental Policy Act requires that all federally funded actions be reviewed for

potential environmental impacts prior to their implementation. DOE/EIS-0236, *Programmatic Environmental Impact Statement for Stockpile Stewardship and Management*, issued September 1996 by the DOE, and subsequent Record of Decision describe a reduced footprint for Defense Programs activities at the Y-12 Plant. Building 9206 was not one of the facilities identified for continued use. Activities required to shutdown Building 9206 are similar to those described in several DOE approved Generic Categorical Exclusions (CX'S).

The CX-GEN-011, *Categorical Exclusion for Maintenance Activities*, approved October 7, 1997, allows for relocation/removal of equipment, facility components, and associated systems; modification of utility systems; decontamination of tools, Rooms, and other interior surfaces; and maintenance of surplus facilities. CX-GEN-012, *Categorical Exclusion for Alterations to Existing Buildings, Construction of Small Scale Support Structures, and Relocation of Machinery and Equipment*, approved October 7, 1997, allows relocating machinery and equipment to other facilities where the uses of the relocated items would be similar to their former uses and consistent with the general missions of the receiving structure. CX-GEN-016, *Categorical Exclusion for Deactivation of Facilities* approved October 7, 1997, allows utility services after it has been determined that continued operation of such systems was not needed for safety or for the control of hazardous materials. This CX also allows actions required to place a facility in an environmentally safe condition, including reducing surface contamination; identifying, characterizing, and removing/disposing of materials, equipment, or waste; plugging sinks, drains, and toilets to prevent inadvertent discharge of liquids; properly storing or disposing of documents and records; and generally preparing the areas to reflect good housekeeping.

All CX's listed above require that waste materials from such activities be appropriately characterized and disposed of at existing permitted/approved waste storage, treatment, or disposal facilities. Actions should be evaluated by pollution prevention personnel for options to reduce or eliminate generation of waste materials and to reuse/recycle all possible material or equipment.

The National Historic Preservation Act (NHPA) also requires review of projects for potential adverse effects to properties constructed before 1960 or properties included or eligible for inclusion in the National Register of Historic Places. Building 9206 has been identified as eligible for inclusion in the National Register and as contributing to the Historic District of the Y-12 Plant. Photos, drawings, and facility documents pertinent to the history and use of the facility should be collected as they are identified during the shutdown, and stored for preparation of a MOA that would be required prior to final decommissioning of the facility. The MOA would describe the decommissioning plan and measures to mitigate the adverse impacts to historical resources, and must be submitted to the State Historic Preservation Officer and the Advisory Council on Historic Places for concurrence.

10.8 CLEAN AIR STRATEGY

Section V of the Clean Air Act of 1977 (CAA) adopted in the 1990 amendments to the CAA, establishes a federal permitting program which will be administered by the states. Any "major source" of criteria pollutants or of hazardous air pollutants will be required to obtain a permit to operate the source.

Current Status

Y-12 Plant and Building 9206 are regulated by the Tennessee Air Quality Act and requests for air permit approval/cancellation are submitted to the Tennessee Air Pollution Control Board via the source, TDEC. Building 9206 currently has air emission source operating permits for active air emission sources. There are several sources that have been determined to be exempt. The 9206 recovery furnace is included in the Building 9206 permits.

Deactivation Strategy

As the deactivation activities are identified, scoped, and approved by the 9206 OSB; the activities will be evaluated for their potential to increase emissions to the atmosphere. Those activities will then be compared against the applicable air operating permit(s) to determine if revisions are necessary or if additional operating permits may be required.

Any activity requiring a notice of construction will also require an updated air operating permit, which will be prepared according to Y-12 plant procedure/guidelines and submitted to the State of Tennessee for approval. All new activities, construction, or modifications at the 9206 Complex that have the

potential for increasing radioactive air emissions are required to be evaluated to determine if a notice of construction needs to be developed. The 9206 Complex currently has no notices of construction.

Post Deactivation Strategy

After deactivation, the facility conditions and stack statuses will be evaluated to determine if the stack(s) and vent(s) can be removed from the TDEC registered stack list and air operating permit(s) canceled.

10.9 CLEAN WATER ACT/SAFE DRINKING WATER ACT

The Clean Water Act of 1972 (CWA) requires any source that discharges a "pollutant" into a surface water body to obtain and operate in compliance with an National Pollution Discharge Elimination System (NPDES) permit. The CWA includes radioactive materials in its definition of pollutant. However, the EPA interpreted "pollutant" to exclude radioactive materials regulated under the Atomic Energy Act (AEA) of 1954. The CWA applies to naturally occurring and accelerator-produced radioisotopes; it does not apply to source, special, or byproduct materials as the AEA defines those terms.

Current Status

Building 9206 is covered under the Y-12 Plant ECO CWA and Safe Drinking Water Act programs. Currently, the following effluent streams are discharged from Building 9206:

- Demineralized water;
- Process water - drains to storm sewer, separated from sanitary water with a back flow preventor;
- Sanitary/potable water;
- Safety shower/eye bath - drains to storm sewer, separated from sanitary water with a back flow preventor;
- Fire sprinkler system water - separate system from either sanitary or process water. Post deactivation cutoff will be evaluated as a part of the FHA and for long-term S&M needs;
- Steam - used for building heat; and
- Cooling tower water supply and return lines - are not in use, blanked off.

The majority of the storm water drains in the operating area are raised off the floor and sealed or plugged to meet nuclear criticality requirements. Drains, as well as safety shower/eye bath systems, are routinely inspected under the 9206 surveillance program.

As part of a sitewide initiative, the Y-12 ECO Clean Water program staff performed a physical inspection and inventory verification of Building 9206 storm sewer and sanitary water drains in 1998. The purpose was to update the storm and sanitary sewer drain drawings and to collect information in preparation to having building drains placed onto a database server for future sitewide accessibility to drain information. Drains were given identification numbers and labeled, and drain paths were traced. Corrective actions were made as needed. Y-12 document, Y/TS-612, *Y-12 Drain Identification Point Source Information for Data Base Buildings Phase IV*, November 27, 1992, is being updated to reflect current conditions.

Deactivation Strategy

During deactivation as systems are drained and/or valved off, it will be necessary to ensure integrity between water systems. The majority of the water systems will be isolated and valved off at the building point of entry. All ties and/or modifications will need to be reviewed before changes are initiated. Fire Protection Engineering and IH will be a part of the subteam performing these evaluations. Permit changes will be evaluated as deactivation progresses.

10.10 CERCLA

Current Status

Y-12 Plant and the 9206 Complex are regulated under CERCLA (1980). The document, *Oak Ridge*

Reservation Federal Facility Agreement Under Section 120 of CERCLA, November 18, 1991, lists the characterization units under EUO 9206 Complex responsibility that are within the project deactivation scope. The current status and deactivation activities for each unit is as follows:

Deactivation Activities

- YS-245, Building 9206 Underground Tank - this unit has been remediated. The tank was exhumed from the ground. The contents were removed, sampled, and transported in polyethylene tanks for treatment and disposal. The tank was cut apart and transported to the salvage yard for disposal.
- YS-343, Polytank Station (Building 9206) - a closure plan has been submitted and approved. The polytank station, which was used to contain rinse water/mop water and acetic acid, has been removed and remediated.

Example 53

8 Environmental Consequences of the Action

Environmental effects associated with the D&D of the 771/774 Cluster are described as follows:

Environmental Impact Issues

As described in earlier chapters, the 771/774 Closure Project is located entirely within the (secured) Protected Area of the site's Industrial Area (see Figure 2-1). Initial investigations show that many interior surfaces, process drains, piping, gloveboxes, filters, sumps and other equipment are radioactively contaminated.

The proposed closure activities for the 771/774 Closure Project involve asbestos abatement, decontamination of interior surfaces and equipment by vacuuming and wiping, disconnection of electrical power, draining of piping systems and equipment, removal of gloveboxes and other equipment, further decontamination by wiping, washing, scabbling, and other methods, and dismantling and demolition of the buildings. Many of these activities could qualify as categorical exclusions under DOE's NEPA regulations (e.g., removal of asbestos from buildings (B1.16); demolition/disposal of buildings (B1.23); disconnection of utilities (B1.27); and minor activities to place a facility in an environmentally safe condition, no proposed uses (including reducing surface radiological contamination, but not including conditioning, treatment, or processing of spent nuclear fuel, high-level waste, or special nuclear materials) (B1.28).

Given the existing environment and industrial setting environmental impact issues associated with the 771/774 Closure Project are limited in scope. The proposed activities should not result in discernible adverse effects to biological resources, including vegetation, wetlands, wildlife habitat and State and Federal sensitive (e.g., threatened and endangered) species populations or habitat. The buildings to be closed are not located in a floodplain and the proposed activities will not be affected by, or themselves effect, any floodplain. However, due to the building's proximity to the segment of the Walnut Greek drainage located in the Protected Area, this activity may require consulting with the US Fish and Wildlife Service (USFWS) for downstream impacts to the Preble's habitat. A USFWS consultation would determine mitigation measures required by to be employed as appropriate. No wild and scenic rivers, prime agricultural soils, parks or conservation areas or natural resources will be affected. The proposed activities will provide employment for a very small number of people, most from the current site work force; thus the activities are unlikely to result in adverse socioeconomic effects. Closure is not expected to be noticeable off site and thus is not expected to result in major changes in visual quality of the RFETS community area.

Therefore, this discussion of environmental impact issues focuses more intensely on the following areas of potential impacts:

- Mobilization of radioactive and other contaminants into the environment via soils, air, surface waters, or groundwater,
- Health and safety of workers who may be exposed to radioactive and toxic or hazardous

materials (including lead, asbestos, and PCBs), and health and safety of the public, both during normal closure activities as well as accidents,

- Environmental issues associated with waste management, including the contribution of wastes generated by the proposed activities to the decreasing site-wide capacity for interim storage and transportation of waste,
- The physical removal of Building 771 as an historic structure that is eligible for the National Register of Historic Places and a secondary contributor to a potential Historic District comprised of Cold War Era facilities at RFETS, and
- This project's contribution to site-wide cumulative impacts.

8.1.2 Geology and Soils

Closure activities in the 771/774 Closure Project will disturb minor land acreage most of which has been previously disturbed. Activities such as excavation could cause localized landslides or slumping to occur. Some recontouring of the soils may occur after buildings are removed to restore soil in areas disturbed by demolition equipment. There will be short-term increases in soil erosion and siltation and small temporary losses of soil productivity. Volatile Organic Compound (VOC) and radionuclide contamination already exists in the Building 771 footprint and adjacent areas. Additional contamination of soils from closure activities is not expected because building structures will be decontaminated prior to demolition of the structures themselves.

8.1.3 Air Quality

Potential impacts to air quality resulting from the closure of the 771/774 Closure Project buildings include asbestos emissions resulting from asbestos removal, Beryllium emissions resulting from the decontamination and removal of equipment and building materials, radionuclide emissions resulting from the decontamination and removal of equipment, hazardous air pollutant from removal of chemical systems and fugitive dust emissions resulting from transportation activities associated with the closure and demolition activities. Air emissions from these activities will be controlled and monitored in accordance with the Site Health and Safety Program.

Asbestos is present in several areas, primarily in the form of pipe insulation. These materials will be removed by a properly certified contractor in accordance with applicable State, and Federal regulations. Assuming that the removal, transportation, and final disposition are in accordance with applicable regulations, there is minimal risk of an asbestos release to the air.

Some equipment within Building 771 is potentially contaminated with beryllium. The housekeeping action level for beryllium contamination is 25 µg/ft². Cleanup and removal of materials and equipment contaminated with beryllium has a very small potential to cause a release to the air. Management of the contaminated materials and equipment in accordance with current site procedures will result in minimal risk to both on- and off-site personnel.

Decontamination, size reduction, removal and ultimate disposal of equipment and materials in Building 771 have the potential to release radionuclides to the air. Decontamination and size reduction activities take place within containment (either glovebox, B box or hood) that is equipped with a HEPA filter. In addition the building room exhaust is equipped with HEPA filters. This essentially eliminates the potential for a radionuclide release short of an accident during the transportation of the contaminated material. Stack monitoring is also conducted to ensure the integrity of the HEPA filtration equipment.

Decontamination, size reduction, removal and ultimate disposal of equipment and materials in Building 771 also have the potential to release chemicals to the air. Mitigative actions may be taken to reduce the resulting emissions as appropriate.

Fugitive dust emissions will result from the transportation of materials and wastes from the 771/774 Closure Project. There will be significant short-term fugitive dust emissions during the demolition of the structure itself without taking mitigation measures. Building 771 is a reinforced concrete and cinder block construction that will require the use of heavy equipment to reduce. Because of the distance of the Cluster from site boundaries impacts will be short-term to personnel working in areas approximate to the 771/774 Closure Project.

Miscellaneous chemicals and other hazardous materials will be removed from several structures within the 771/774 Closure Project. These materials will be managed in accordance with existing site procedures and there will be little risk for air emissions.

8.1.4 Water Quality

Because the scope of work authorized by this DOP does not include the demolition of Building 771 and 774, and since no other structures of the 771/774 Closure Project will be removed below ground level completion of the 771/774 Closure Project is not expected to change storm water runoff, storm water percolation or surface water flow characteristics. (Changes resulting from remediation activities outside this project will be dealt with in their documentation.)

Because 771/774 Closure Project will remove portions of ancillary structures (trailers) off ground level, some new bare ground is expected to be exposed to wind or water erosion. If appropriate in specific instances silt fencing or similar protective device would be installed to prevent or minimize the possibility of water-borne soil leaving the immediate area and entering drainage ways. Demolition activities may, however, deposit small debris on the surrounding pavement or ground surface that could be carried away by storm water runoff. Quantities of such material are expected to be small.

Among the techniques under consideration for decontamination of the 771/774 Closure Project are the use of water or steam to remove radiological contamination and loose debris. While this technique is effective in removing radiological contamination, it also generates large volumes of potentially contaminated water and may even contribute to the spread of radiological contamination. Surface water samples from the 771/774 Closure Project drainage sub-basin will be collected using an automated station located to pull samples from the entire sub-basin's runoff. Water used for decontamination will be treated prior to release.

Because no work will be done below ground level ground water should not be affected.

8.1.5 Human Health Impacts

Closure has the potential to expose involved workers, non-involved workers and expose the public to radiological and other chemical contamination because the nature of the work is to remove or fix-in-place contamination. Disruption of contaminants or hazardous materials increases the chance of the contaminant or materials being dislodged, becoming airborne, and being inhaled by or deposited on humans.

8.1.6 Radiological Impacts

For involved workers, closure activities at Building 771 are estimated to result in an average yearly dose of 100-200 mrem to each worker involved in closure of the Building Cluster. Annual exposures are expected to decline over the life of the project, as higher risk activities are addressed early on in the process. This exposure would be expected to result in less than 1 (0.07) latent cancer fatalities, assuming the same worker group conducted both deactivation and decontamination activities. Doses to co-located workers from closure operations at Building 771 alone have not been evaluated. However, the annual radiological exposure of a maximally exposed co-located (unprotected) worker as a result of site-wide closure activities is estimated at 5.4 mrem (a mrem is 1/1000 of a rem). The corresponding risk of a latent cancer fatality to this worker is two in 1,000,000 (Cumulative Impact Document (CID), Section 5.8.1).

Annual dose to the maximally exposed off site individual from site closure activities is estimated at 0.23 mrem, with a corresponding excess latent cancer fatality of 1 in 1,000,000. The annual dose to the public as a result of all activities in the RFETS closure project at the peak time of exposure (1997 - 2006) is expected to be a total of 23 rem for all of the 2.7 million people projected to be living within 50 miles of the site in 2006. This annual dose of 23 person-rem would be expected to result in less than one (0.01) latent cancer fatality in the entire Denver area population. Estimated annual dose to the maximally exposed off-site individual is well below the applicable standard of 10 mrem/year (CID, Section 5.8.2).

Estimated doses from the 771/774 Closure Project are expected to be a small fraction of those estimates for site-wide activities as described above. For comparison purposes, DOE's annual limit for occupational exposure as a result of all activities and through all exposure pathways is 5,000 mrem (5 rem) per person. Natural background radiation in the Denver area results in an annual exposure of approximately 350 mrem per person.

Exposures to workers and the public will be controlled and monitored in accordance with the RFETS radiation safety program.

8.1.7 Non-Radiological Impacts

Non-radiological health effects (from exposure to chemicals) are measured by a hazard index. A hazard index greater than one is considered to be a basis for concern, and the greater the index is above one, the greater the level of concern.

For the full suite of site closure activities (including closure of all buildings), a hazard index of 1.2 has been calculated for a co-located worker who is chronically exposed during working hours to all chemicals of concern simultaneously (as described in the CID) over the entire period of site closure. The corresponding cancer risk is 6 in 100,000 (CID Section 5.8.3).

For the full suite of site closure activities (including closure of all buildings), a hazard index of 1.5 has been calculated for a member of the public who is chronically exposed every day for 70 years to all chemicals of concern (as described in the CID) simultaneously (a highly unlikely event). A more reasonable scenario of exposure to a single chemical showed hazard indices of well below one for each potentially released chemical, analysis of potentially carcinogenic air pollutants indicates a cancer risk of 3 in 10,000,000 for the maximally exposed off site individual (CID Section 5.8.4).

Estimated non-radiological impacts from the 771/774 Closure Project are expected to be a fraction of those estimated for site-wide activities, as described above. Exposures to workers and the public will be controlled and monitored in accordance with the RFETS toxic/hazardous materials and chemical safety program.

8.1.8 Occupational Hazards

In addition to exposure to radiological and chemical hazards, workers at the site are exposed to a variety of industrial hazards such as heavy machinery, repetitive motion tasks, and physical agents such as heat and cold. Using a general industry rate for construction to estimate injury and illness cases, site closure activities are estimated to result in 584 cases of injury and illness during the peak activity period (1997 - 2006) (CID, Section 5.8.3). The portion of these cases that would be estimated to result from the Building 771 closure alone would be less than the total site figure.

The general industry rate of injury and illness is considerably higher than the historic incidence rate for the site; occupational hazards will be controlled, mitigated and monitored in accordance with the RFETS occupational health and industrial safety programs.

8.1.9 Plants and Animals

Because the 771/774 Closure Project is located in the previously disturbed Industrial Area, impacts to plants and animals are expected to be minimal. Possible minor impacts to other vegetative areas may result as fugitive dust may distribute undesirable materials among existing plant species. Additional impacts may occur to vegetation associated with increased traffic in order to accommodate the closure equipment. Increased traffic, both vehicular and pedestrian, could result in some vegetation disturbance.

Some of these mammals such as rats, mice and raccoons are known to be residents of or visitors to the Industrial Area. These mammals would be displaced and some mortality would occur as a result of closure activities. Bird nests attached to buildings planned for demolition would be destroyed, although no direct bird mortality is anticipated.

8.1.10 Waste Management

Environmental impact issues associated with waste management are related to human health issues, storage capacities, and transportation. In general, waste generated from the 771/774 Closure Project includes contaminated and uncontaminated equipment, tools, electrical conduit systems, piping systems, gloveboxes and facility structural materials.

Closure activities will be performed to remove radiological contamination and hazardous constituents. Items that have been decontaminated to a free release condition will be transferred for use at a different location within RFETS, for use at a different DOE facility, or sent to the PU&D organization for appropriate handling. Mixed waste generated from closure activities will be stored in permitted areas on-site, or where feasible, shipped to an approved off-site disposal site. On-site storage of mixed waste will be in accordance with approved site procedures until the material can be shipped for final disposal. Hazardous materials and excess chemicals will be managed as waste, where applicable and disposed of in accordance with established procedures. Materials and waste will be characterized, stored and disposed of in accordance with the requirements of approved site waste management procedures that meets state and Federal regulations.

Waste minimization will be utilized in the planning and management of the 771/774 Closure Project closure wastes. Elimination and reduction of waste generated as a result of closure is a high priority. Standard decontamination operations and processes will be evaluated for waste minimization potential and suitable minimization techniques will be implemented.

With respect to transportation concerns, the 771/774 Closure Project closure project would generate and package materials suitable to meet DOT transportation requirements.

8.1.11 Historic Resources

The environmental impact issue related to historical resources is the loss of Building 771 as a historic structure eligible for the National Register of Historic Places and a secondary contributor to a potential Historic District comprised of Cold War Era facilities. A related cumulative impact is discussed in a subsequent section.

Sixty-four buildings within the site's Industrial Area, including Building 771, have been identified as important to the historic role of the site in manufacturing nuclear weapons components during the Cold War. Building 771 was originally constructed in 1951, with a number of additions between 1962 and 1974. While this building like the others is less than 50 years old, it is considered historically significant as an essential component of the weapons production activities at RFETS.

Negotiations have been completed between DOE and the State Historic Preservation Officer (SHPO) concerning the appropriate mitigative measures applicable to these buildings; Building 771 will be subject only to documentation requirements (collection or creation of construction drawings and photographs), rather than preservation. No modification of or damage to the building will occur prior to completion of such an agreement and completion of documentation according to standards accepted by the SHFIO.

8.1.12 Noise

Closure and demolition of the 771/774 Closure Project are not expected to significantly increase noise levels in the Rocky Flats area. Most activities will take place inside the associated building so noise levels, if elevated over ambient levels, will be confined to the 771/774 Closure Project structures in which they are generated. Other less common activities such as scabbling (use of a machine to remove layers of concrete), blasting (use of various materials such as sand, dry ices, or other abrasives to remove surface radiological contamination), and demolition by backhoe ram, hydraulic cutters, or other devices are expected to generate noise levels higher than ambient noise levels. However, workers involved in those activities will use appropriate hearing protection devices during activities expected to generate high noise levels. Outdoor activities will take place at a distance from unprotected workers and the public and thus are not expected to increase noise levels to these

populations to an unsafe level.

8.1.13 Socioeconomic Effects

Potential impacts from the 771/774 Closure Project would contribute to a net overall loss of employment in the long run. The current on-site work force in the building would either be drawn into the closure activities for the building (and potentially for the entire site) or voluntarily lose employment. In the short run, the closure activities could actually increase the employment level due to increased work force levels associated with closure activities. Additionally a modest increase of purchases (raw materials, etc.) may result due to closure activities in the short run.

Under the worse case scenario, if the entire work force currently housed in the 771/774 Closure Project all opted for voluntarily unemployment, the net overall impact would not have a great adverse effect on the Denver Metropolitan area nor would it adversely effect Boulder or Jefferson Counties, where the majority of the work force reside. Taken as a single building, the net effects are expected to be minimal.

8.1.14 Cumulative Effects

Impacts associated with the 771/774 Closure Project would contribute incrementally to potential site-wide cumulative impacts associated with the overall site closure program.

Some of these cumulative impacts may ultimately prove to be beneficial to the environment, assuming that the activities result, as expected, in the restoration of much of the site's original, natural condition prior to construction. (Remediation is currently scheduled to follow building demolition.) Removing human occupation, structures, and paved surfaces and reestablishing native grasses and other vegetation could restore native plant communities and increase wildlife habitat, including threatened and endangered species. Cleaning up contamination will reduce health risks to human and animal populations.

For other cumulative impacts, including the final remediation phase that will be conducted outside of this project further study may be warranted. As with the 771/774 Closure Project, decontamination and closure of structures site-wide will generate transuranic, low-level, low-level mixed waste, and industrial (landfill) waste. Existing on-site interim storage for radioactive waste is limited (DOE/EA-1146), and eventually, as site-wide closure progresses, additional storage capacity may be needed. The same is true for industrial waste.

Also, demolition of the 771/774 Closure Project is part of a potential cumulative effect to historic resources. Demolition of all result in the physical removal of a historic structure that is eligible for the National Register of Historic Places and a secondary contributor to a potential Historic District comprised of Cold War Era facilities. Other historic structures within this district are also proposed for closure and presumed demolition. The cumulative effect of these removals may be significant (see mitigation measures below). Also, the collective effect of removing most or all of the structures would be visually dramatic. High profile structures that have dominated the site and the local skyline for 45 years would be eliminated. The landscape would take on a less industrial and more open, rural appearance, similar to the rangeland that characterized the area before the plant was constructed.

8.1.15 Mitigation Measures

Mitigation measures are prescribed to reduce or avoid potentially adverse effects associated with a proposed activity. For the decontamination and closure of the 771/774 Closure Project, mitigation measures will be considered in the areas of human health, worker safety, release of emissions and mobilization of contaminants and cultural resources.

Closure will be conducted in accordance with applicable worker and public health and safety programs and activities will be managed so that emissions and discharges are within applicable regulatory limits. As required, closure will take place within containment of existing buildings or temporarily constructed facilities (e.g., tents) with functioning drainage, air filtration and other safety and environmental

protection systems commensurate with risks inherent in the activities being conducted.

Precautions will be taken to ensure compliance with the Migratory Bird Act that prohibits destruction of birds or their nests, active or inactive without a permit. Building surveys for such nests in the 771/774 Closure Project will be conducted prior to demolition.

No closure activities will take place in or near habitat of known threatened or endangered species.

No modification or damage to buildings determined to be eligible for the National Register of Historic Places will occur prior to completion of the documentation requirements in accordance with the standards set forth in the Memorandum of Agreement with the SHPO.

8.1.16 Unavoidable Adverse Effects

The 771/774 Closure Project closure activities if conducted as proposed will have the following unavoidable adverse effects:

- Physical removal of an historic structure that is eligible for the National Register of Historic Places and a secondary contributor to a potential Historic District comprised of Cold War Era facilities,
- Short-term increases in air emissions and water discharges,
- Radiation and chemical exposures to workers, co-located workers, and the public, resulting in a small, but increased risk of adverse health effects,
- Possible industrial accidents, resulting in injury and illness, and
- Increased noise levels for the duration of closure activities.

8.1.17 Short-Term Uses and Long-Term Productivity

Unlike most projects that commit a Site to a particular use for a period of time, the effect of closure will be to undo past commitments concerning use of the Site and open up a new and broad range of potential future uses. Closure does not commit the Site to a particular land use rather, closure of the 771/774 Closure Project will be one step in the process of ending one use and opening consideration for a variety of other possible future short- and long-term uses.

8.1.18 Irreversible and Irretrievable Commitments of Resources

Closure is essentially a destruction project eliminating existing uses not a construction project consuming land and building materials. The completion of the 771/774 Closure Project will release land and perhaps some buildings for other uses. Funds, labor, equipment, fuel, tools, personal protective equipment, waste storage drums and similar items are resources that will be irretrievably committed to the Closure Project.

8.2 Overall Cumulative Impacts Analysis for RFETS Site Closure

The following is a summary of insights gained from the CID impacts analysis and risk assessments relative to human health, safety and the environment:

- Both the radiological and non-radiological risks to the workers, co-located workers and public as a result of normal operations are lower than during the weapons production years.
- Radiological and non-radiological risk to the workers, co-located workers and public as a result of normal operations is minimal and well below the Clean Air Act and EPA standards.
- Radiological risk to the workers, co-located workers and public as a result of normal operations is dominated by SNM activities, residue stabilization and individual facility disposition of the plutonium facilities. Once these activities are completed, doses and excess latent cancer fatalities to the workers, co-located workers and public become insignificant.
- For the baseline case, radiological accident risks dominate the overall risks to the workers, co-located workers and public. However, of the closure case, risks to the workers, co-located workers and public are initially dominated by radiological accident risks, until around 2006, when residue stabilization, SNM consolidation activities and initial deactivation efforts that

remove or fixate holdup are completed. Then the risks are dominated by normal operations involving the individual facility disposition process and environmental restoration as the plutonium buildings' nuclear ventilation systems go through the individual facility disposition process.

- Probability of a seismic event contributes over 90% of the risk to the co-located worker, maximally exposed off-site individual and 50 mile population for both overall baseline case accident risks and to the overall closure case accident risk during the peak year.

The following closure operations and activities contribute the most to reducing the risk of accidents caused by seismic events and thereby overall accident risk to the workers, co-located workers, and public in the following order of priority based on the projected schedules:

- consolidating plutonium oxides into building 371,
- repackaging the dispersible residues into the pipe/drum component or storing in building 371,
- removing plutonium hold-up,
- shipping TRU/TRM waste drums to WIPP,
- transferring SNM from building 371 to the ISV or shipping off-site,
- shipping other TRU/TRM waste to WIPP and shipping LL/LLM waste off-site.

The CID provides a comparative summary of the two cases in terms of the expected environmental impacts. The following are some insights gained from the ecological risk assessments and impacts analysis relative to the environment.

Short-term impacts on wetlands, sensitive habitats, wildlife and species of special concern may occur as a result of extensive site closure activities. There is however, no natural resource injury expected. Closure activities are not expected to result in the irretrievable or irreversible commitment of any natural resources of the site. Closure activities will be evaluated in light of the potential for natural resource injury and applicable mitigation measures will be taken to minimize the potential for natural resource injury to the extent practicable.

The closure case anticipates use of a flow-through water management system for on-site water management ponds and then the eventual conversion of the ponds to wetlands. This action may initially reduce the open-water habitat on the site created by the water management ponds, but as the ponds are converted to wetlands, wetland species diversity would increase and overall biodiversity at the site would be improved over the long term. All other on-site environmental impacts are considered low for both cases and no natural resource injury is expected.

Cumulative impacts are impacts on the environment resulting from the incremental impacts of an action when added to other past, present and reasonably foreseeable future actions carried out both by the federal agency and other entities within the geographical region. Significant impacts could result from several smaller actions that, by themselves, may not have significant impacts. Cumulative impacts associated with either case and any potential developments in the region of the site would include:

- Increased surface runoff and decreased groundwater discharge because of the use of on-site landfill or Corrective Action Management Unit (CAMU) caps.
- Short term impacts to wetlands habitat, riparian habitat, and open water habitat, aquatic habitat, native grasslands communities and species of special concern. However, once the water management ponds are converted to wetlands, biodiversity is expected to increase.
- Minor cumulative impacts to surrounding land uses primarily along state routes and local roadways.
- Increased traffic volume resulting from off-site shipments of Pu Pits and wastes potentially causing congestion problems.
- Increased traffic accidents resulting in fatalities and potential latent cancer illnesses related to motor vehicle emissions, fugitive dusts and brake/tire wear.
- Socioeconomic impacts from reductions in the site's workforce will not substantially affect surrounding region due to additional growth projected in the area.

Overall, substantial cumulative impacts are not anticipated from the closure of Building 771.